DOCUMENT RESUME

ED 431 803 TM 029 889

AUTHOR Dorman, Jeffrey P.
TITLE The Development of an Instrument To Assess Institutional-Level Environment in Universities.
PUB DATE 1999-04-00
NOTE 21p.; Paper presented at the Annual Meeting of the American Educational Research Association (Montreal, Quebec, Canada, April 19-23, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150) -- Tests/Questionnaires (160)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *College Faculty; *Educational Environment; Evaluation Methods; Foreign Countries; *Higher Education; *Institutional Characteristics; Teacher Attitudes; *Test Construction
IDENTIFIERS Australia

ABSTRACT

This study reports the development and validation of an instrument to assess institutional or university-level environment in universities. Using a sample of 489 academics from 52 departments in 28 Australian universities, an instrument called the University-Level Environment Questionnaire (ULEQ) was field-tested and validated. The final form of the ULEQ consists of 42 items assigned to 7 scales: Academic Freedom, Concern for Undergraduate Learning, Concern for Research and Scholarship, Empowerment, Affiliation, Mission Consensus, and Work Pressure. Validation data showed that the ULEQ has sound structural characteristics, thus suggesting that it should prove to be an important research tool for individual academics, departments, and universities interested in improving their learning environments. An appendix contains the ULEQ. (Contains 5 tables and 55 references.) (Author/SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: TM
In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view. HE

ED 431 803

THE DEVELOPMENT OF AN INSTRUMENT TO ASSESS INSTITUTIONAL-LEVEL ENVIRONMENT IN UNIVERSITIES

Jeffrey P. Dorman
Australian Catholic University

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
Jeffrey Dorman
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

TM029889

Paper presented at the annual meeting of the American Educational Research Association (AERA), Montreal, April 1999.

Correspondence concerning this paper should be addressed to Jeffrey Dorman, School of Education, Australian Catholic University, PO Box 247, Everton Park, Queensland 4053, Australia

Tel: (+61 7) 3855 7219 Fax: (+61 7) 3855 7247

Email: J.Dorman@mcauley.acu.edu.au

BEST COPY AVAILABLE

ABSTRACT. This study reports the development and validation of an instrument to assess institutional or university-level environment in universities. Using a sample of 489 academics from 52 departments in 28 Australian universities, an instrument called the University-Level Environment Questionnaire (ULEQ) was field-tested and validated. The final form of the ULEQ consists of 42 items assigned to seven scales: Academic Freedom, Concern for Undergraduate Learning, Concern for Research and Scholarship, Empowerment, Affiliation, Mission Consensus, and Work Pressure. Validation data showed that the ULEQ has sound structural characteristics, thus suggesting that it should prove to be an important research tool for individual academics, departments, and universities interested in improving their learning environments.

Introduction

Over the past 30 years, much learning environment research has been conducted in primary and secondary schools. Various reviews of research attest to the extensive development of this research field (e.g. Fraser, 1994, 1998a). An important focus of this research has been the development and validation of instruments to assess particular learning environments. Although some of this research has investigated the environment in tutorial and workshop settings of universities (Fraser and Treagust, 1986), no recent studies have considered the overall or institutional environment as distinct from the classroom environment in universities. That is, studies of university-level environment which involve academic staff in reporting their perceptions of the overall climate or atmosphere of the university has been a neglected area of research. A possible obstacle to such research is the lack of a contemporary instrument to assess the salient dimensions of university-level environment.

The purpose of the present paper is to address this deficiency by reporting the development and validation of an instrument to assess university-level environment in Australian universities. Apart from the need to develop such an instrument, this study was important because the use of quality assurance mechanisms in universities in Australia and other Western countries is becoming accepted practice. Accordingly, university administrators should be concerned about the overall environment of the university. An assessment of the university-level environment should be regarded as one component of any broad evaluation of a university. Following this introductory section, background information on Australian universities, analogous school environment research and prior university-level environment research are discussed. The next section describes the instrument's development and the structure of its final form. Comprehensive validation data for the instrument obtained from the sample of 489 academic staff in Australian universities are reported in the next main section. The concluding section suggests possible research directions using this new instrument.

Background

Australian Universities

As in many Western countries, higher education in Australia has undergone major changes during the past decade. According to the Department of Employment, Education, Training and Youth Affairs (DEETYA, 1997), dramatic changes have occurred in size, structure, funding arrangements and focus of higher education institutions. In 1987, the binary system which separated 19 universities from 69 colleges of advanced education was abolished in favour of a Unified National System. By 1994, amalgamations and mergers had resulted in there being 36 publicly-funded universities in this system. During the past decade, the Australian tertiary sector has experienced very high growth with student numbers in undergraduate and postgraduate studies increasing from 394,000 in 1987 to 659,000 in 1997 (DEETYA, 1997).

Given the reorganisation and rapid expansion of the higher education sector, the Australian Government recognised the importance of maintaining quality in universities by producing a range of government-sponsored initiatives and associated documents (Baldwin, 1991; Bowden and Sachs, 1997; Dawkins, 1988; Higher Education Council, 1992). Baldwin presented a set of measures aimed at enhancing the quality of university teaching and research. Subsequently, the Higher Education Council proposed that all tertiary institutions develop quality assurance and management

procedures. The result of these initiatives was that, from 1993 to 1995, a quality assurance program focusing on teaching, learning, research and community service was implemented in all Australian universities under the direction of a Ministerial advisory body called the Committee for Quality Assurance in Higher Education. To ensure compliance with the demands of the quality assurance process, significant financial incentives were provided to participating universities. One defining feature of the present Australian government's approach to quality assurance and improvement in higher education is "a process that, as far as practicable, is hard-edged through the application of quantitative performance indicators and benchmarks which are carefully selected, genuinely meaningful, and recognises institutional diversity" (Higher Education Council, 1997, p. 3). Wilson (1996), the Chair of the Committee for Quality Assurance in Higher Education summed up the importance of quality assurance to Australian universities in the 1990s by asserting that the worldwide phenomenon of quality in higher education must be considered the theme of the decade.

One important determinant of learning in any school or university is the quality of its learning environment. In its review of teaching in British universities, the Polytechnics and Colleges Funding Council (1990) stated that the ethos of the whole institution largely determines the student's experience and that this notion of institutional ethos is an important contributing factor to quality in higher education institutions. In Australia, the Higher Education Council (1992) suggested that the learning environment is likely to have an important effect on how students learn and that there are many aspects of this environment that can be influenced by government and institutional action to the benefit of educational quality. It follows that assessments of university-level environments should be an integral part of quality assurance mechanisms. According to the Higher Education Council (1992), administrative and support staff who do not venture formally into classrooms mediate the effectiveness of the teaching-learning process in universities. Therefore, the need to go beyond the classroom and investigate the institutional or university-level environment becomes acute if total quality assurance is a strategic objective of the institution. There is little doubt that the Australian government's interest in quality assurance has a strong focus on outcomes. However, quite apart from the view that positive environments are associated with enhanced student learning, it needs to be accepted that good working environments in universities are intrinsically desirable goals.

Analogous School Environment Research

For many years, school environment has been acknowledged as an important and vital aspect of any school. Documents spanning 140 years of education in Australia allude to the central role of the environment in fostering student cognitive and affective growth. Erickson (1981) concluded that the most effective schools are distinguished, not by elaborate facilities, extensively trained teachers, small classes, or high levels of financial support, but by outstanding social climates. These findings are remarkably similar to those of Rutter et al. (1979) whose study of London schools concluded that school processes collectively produce a unique spirit or ethos. According to Anderson (1982), a large number of studies conducted in the 1960s and 1970s concluded that school environment enhances a range of student-centred variables: cognitive and affective outcomes (e.g. Barker, 1963; Brookover et al., 1978; Duke and Perry, 1978); values (e.g. Vyskocil and Goens, 1979); and personal growth and satisfaction (e.g. Bailey, 1979; Coyne, 1975). Other studies investigated school environment dimensions as criterion variables. For example, rapport between staff and administration was found to be related positively to school environment in studies conducted by the New York State Department (1976) and Ellett and Walberg (1979). Flagg (1965) established links between school size, teacher turnover, principal characteristics and school environment. In his review of Goodlad's (1984) *A Place Called School*, Glatthorn (1984) suggests that *most satisfying*

and *least satisfying* schools were distinguished by a subtle distinction in climate and usually involved relationships between teachers and students, teachers and administrators, and parents and school personnel. The fact that such relationships are manipulable reinforces the generally held view that environments are dynamic rather than static and that environments can be modified.

Historically, school environment has been associated with the field of educational administration in which schools are viewed as formal organisations. As such, they are similar to most social groupings in that they have goals, rules, roles, a hierarchy of authority, reward systems, forms of compliance, coordination activities and communication patterns (Thomas, 1976). One particularly useful conceptualisation of school environment is in terms of the school's organisational climate and psychosocial characteristics (Moos, 1974). Within this approach, schools are understood solely in terms of the perceptions of their inhabitants in a framework of person-milieu interaction (Fraser and Rentoul, 1982). Accordingly, school environment has been assessed through the perceptions of teachers on the school staff, primarily because they can comment on staff-related issues of which students might not be aware. School environment instruments typically possess several internally consistent and independent scales, each of which has between five and eight items. Many research studies conducted during the 1960s and 1970s were facilitated by the *Organizational Climate Description Questionnaire* (OCDQ), an instrument pioneered by Halpin and Croft (1963) and which relied heavily on previous work in business organisations. The shortcomings of the OCDQ have been well documented (e.g. Kottkamp et al., 1987; Thomas, 1976).

Two instruments that have been used in recent school environment research are the *Work Environment Scale* (WES; Moos, 1986) and the *School-Level Environment Questionnaire* (SLEQ; Fraser, 1994). Although not specifically designed for use in schools, the WES has been used to assess ten dimensions of school environment: Involvement, Peer Cohesion, Staff Support, Autonomy, Task Orientation, Work Pressure, Clarity, Control, Innovation, and Physical Comfort (Fisher and Fraser, 1991; Fraser et al., 1988). Validation data for both of these studies attest to the usefulness of the WES in school settings.

The SLEQ was developed specifically for school settings and has become an important research tool in Australia and the United States. The latest version of the SLEQ has eight scales: Student Support, Affiliation, Professional Interest, Staff Freedom, Participatory Decision Making, Innovation, Resource Adequacy and Work Pressure. Validation data obtained from its use in Australian schools are available (Fraser, 1994). A study by Fisher et al. (1993) investigated relationships between interpersonal teacher interaction and the school environment according to the SLEQ. This investigation confirmed the validity of the SLEQ for use in Australian schools. A modified form of the SLEQ was used to assess school-level environment in a recent Australian study involving principal-teacher interaction and school environment (Cresswell and Fisher, 1996; Fisher, 1997). Some recent school environment research directions include: investigating the relationship between school environment and school improvement (Dellar, 1997); establishing beginning teachers' perceptions of their school environment (Heroman et al., 1997); investigating the relationship between school environment and teacher burnout in Singaporean schools (Ball et al., 1995); and studying the relationship between teacher personality and interpersonal teacher behaviour (Fisher et al., 1998). Templeton and Johnson (1998) used the SLEQ to assess the school environment of an urban school to illuminate what teachers felt to be important factors in developing a safer school environment.

Prior University Environment Research

Significant classroom environment research has been conducted in small group settings (e.g. tutorials, workshops, and science laboratories) in Australian universities during the past decade

(Fraser, 1998a; Fraser and Treagust, 1986). The *College and University Classroom Environment Inventory* (CUCEI) was developed by Fraser and Treagust to assess seven psychosocial dimensions of small groups: Personalisation, Involvement, Student Cohesiveness, Satisfaction, Task Orientation, Innovation, and Individualisation. Cross-national environment research in university science laboratory classes using the *Science Laboratory Environment Inventory* (SLEI) was conducted in the early 1990s (Fraser et al., 1992). A number of existing classroom environment scales used in secondary schools could be modified for use in university classrooms, but a detailed review of these instruments is outside the scope of this paper. Several reviews of classroom environment literature that describe these instruments are available (see e.g. Fraser, 1994, 1998a, 1998b).

Other studies have focused on the environment of university departments and instructional processes. Using an eight-scale course perceptions questionnaire in one British university, Ramsden (1979) investigated links between student perceptions of department environment and their approaches to learning. Independent research conducted by Gaff et al. (1976) and van Rooijen (1986) in The Netherlands focused on the importance of department environment in European universities. The study by van Rooijen employed a 58-item instrument called the *University Learning Environment Evaluation* (ULEE) to assess students' perceptions of their department's learning environment and instructional processes. In a departure from the direction of much prior research in the USA, Dippelhofer-Stiem (1986) conceptualised a model with five hierarchically-ordered levels (viz. national, university, subject, courses, and the individual person). This longitudinal study in five universities in the Federal Republic of Germany involved the assessment of students' perceptions of these five levels of environment and students' evaluations of these environments. Recently, Clarke (1995) used a semi-structured, open-ended instrument called the *Perceptions of Learning Environments Questionnaire* (PLEQ) to gather student perceptual data on activities and behaviours in one Queensland university.

In contrast to most of these studies, the present research focused on the university-level environment, a field that was pioneered in the 1950s and 1960s by Pace and his colleagues (Pace, 1963, 1969; Pace and Stern, 1958; Stern, 1970). The *College Characteristics Index* (CCI), an instrument that assesses 30 environment dimensions of universities and colleges, was developed in the 1950s, and refined to form the *College and University Environment Scales* (CUES) in the 1960s. The final version of the CUES has 160 items that assess seven dimensions of environment considered important to universities in the 1960s (viz. Practicality, Community, Awareness, Propriety, Scholarship, Campus Morale and the Quality of Teaching and Faculty-Student Relationships). A second instrument developed in the late 1960s is the *Institutional Functioning Inventory* (IFI: Peterson et al., 1983). This 132-item instrument has 11 scales: Intellectual-Aesthetic Curriculum, Freedom, Human Diversity, Concern for Improvement in Society, Concern for Undergraduate Learning, Democratic Governance, Meeting Local Needs, Self-Study and Planning, Concern for Advancing Knowledge, Concern for Innovation, and Institutional Esprit.

Both the CUES and IFI were important developments in the study of university learning environments. However, they are inappropriate for contemporary learning environment research for four reasons. First, some scales would not be considered salient by academics in universities today. The atmosphere of universities is vastly different to that experienced on many campuses in the 1960s. Second, with 160 and 132 items, respectively, the CUES and IFI lack economy. Their structure is inconsistent with contemporary instruments which have a relatively small number of reliable scales, each with a fairly small number of items. Third, achieving minimal overlap of scales is an important design criterion if results are not to be confounded. Scale intercorrelations for the IFI are generally high, indicating considerable overlap among its 11 scales (Peterson et al., 1983). Fourth, the CUES's Quality of Teaching and Faculty-Student Relationships scale combines conceptually distinct dimensions of the environment.

Instrument Development

The initial development of the instrument in the present study was guided by six criteria. First, the instrument's structure should be consistent with the general structure of contemporary learning environment instruments. A review of classroom and school environment instruments indicated that, ideally, the new instrument should possess several internally consistent scales that have minimal overlap with each other. Second, the instrument must have items and scales that are sensitive to different environments. Third, the instrument must provide good coverage of Moos's (1974) three general categories for conceptualising human environments (viz. Relationship, Personal Development, and System Maintenance and System Change). Fourth, the instrument needed to be consistent with the nature and purpose of universities. To assist with this criterion, a review of relevant literature on the purpose, goals and functioning of universities suggested important dimensions of the institutional environment that the instrument would need to assess. Fifth, the instrument needed to be salient to academics. To ensure salience, scales and items were reviewed by several academics. Sixth, the instrument should be economical in terms of the time needed to answer and score it.

Using these criteria, an 80-item preliminary instrument was developed and field-tested with a sample of 142 academics from the Australian Catholic University. A series of factor, item and reliability analyses were employed to refine the instrument to seven scales each containing six items. The following section describes this instrument — called the *University-Level Environment Questionnaire* (ULEQ). Comprehensive validation data from the use of this final version of the ULEQ in a larger study involving 489 Australian academics are provided in a later section of this article.

The final version of the ULEQ consists of 42 items with six items allocated to each of seven scales. Academics respond to each item using a five-point Likert response format (viz. Strongly Agree = 5, Agree = 4, Not Sure = 3, Disagree = 2, Strongly Disagree = 1). Twelve negatively-worded items are reverse scored. Scale scores are obtained by aggregating the scores for the six items of each scale. Table I shows, for each scale, a scale description, a typical item, and the classification according to Moos's schema described earlier in this paper. One noteworthy feature of the ULEQ is its wide coverage of Moos's three general categories with three Personal Development, two Relationship, and two System Maintenance and System Change dimensions. The ULEQ's emphasis on personal development contrasts with contemporary school environment instruments. Only one scale of the eight-scale SLEQ falls in the personal development domain. Of the ten scales of Moos's WES, only two focus on personal development (Fraser, 1994). This suggests that, compared to school environment instruments, the ULEQ has dimensions that reflect clear differences between university and school environment.

Instrument Validation

This section describes the sample and item, factor and scale analyses used to show the sound structural characteristics of the final form of the ULEQ. It is likely that subsequent applications of the ULEQ could employ the department mean rather than the individual as the unit of analysis. Accordingly, validation data are provided for both the individual and the department mean as units of analysis.

TABLE I
DESCRIPTIVE INFORMATION FOR SEVEN UNIVERSITY-LEVEL ENVIRONMENT SCALES

Scale	Scale description	Typical item	Moos's schema[a]
Academic Freedom	The extent to which staff and students have academic freedom.	Staff and students may discuss any topic. (+)	P
Concern for Undergraduate Learning	The extent to which university processes and teaching approaches emphasise a concern for undergraduate learning.	Staff members are sensitive to the interests, needs and aspirations of undergraduates. (+)	P
Concern for Research & Scholarship	The extent to which the university emphasises research and scholarship.	Senior academics do not emphasise research as an important institutional purpose. (-)	P
Empowerment	The extent to which academics are empowered and encouraged to be involved in decision making.	My superiors deal with me in an authoritarian manner. (-)	R
Affiliation	The extent to which academics can obtain assistance, advice and encouragement and are made to feel accepted by colleagues.	I can rely on my colleagues for assistance if I need it. (+)	R
Mission Consensus	The extent to which consensus exists within the staff with regards to the overarching goals of the university.	Lecturers agree on the university's overall goals. (+)	S
Work Pressure	The extent to which work pressure dominates the environment.	There is constant pressure on academics to keep working. (+)	S

[a]P: Personal Development R: Relationship S: System Maintenance and System Change

Sample

The validation of the final form of the ULEQ involved a sample of 489 academics drawn from 28 of the 36 government-funded Australian universities. Australia has only two private universities and the university sample drawn for this study reflected the diversity in the population of Australian universities. Participants in the study include academics from large research-orientated universities, comprehensive universities, former institutes of technology which have a developing research focus, and former colleges of education which have a tradition of undergraduate teaching. In each university, a total of 20 academics was drawn randomly from three types of departments that reflect the diversity within universities (viz. Science, Education, and English). The overall response rate was 87%.

Item Analyses

An important item characteristic is that the item is sensitive to the different environments in each department. That is, each item should describe a characteristic that is neither too rare nor too

common. This requirement was explored in two ways. First, the endorsement percentage (i.e. the percentages of the sample choosing each response) was calculated for each item. As shown in Table II, the responses for most items reflect a good spread of responses across the five possible alternatives.

TABLE II
ITEM ANALYSES FOR THE UNIVERSITY-LEVEL ENVIRONMENT QUESTIONNAIRE

Item Number[a]	Endorsement percentages					Department sensitivity analysis[b]	
	Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree	Mean of % in agreement in each department	Standard deviation of % in agreement in each department
1	1.0	5.0	6.2	52.2	35.6	92.72	9.75
2	14.2	39.8	11.2	29.8	5.0	52.72	23.16
3	4.9	20.3	17.9	36.1	20.8	70.01	27.23
4	5.2	11.6	8.7	49.1	25.4	79.54	22.68
5	4.8	12.6	7.9	52.2	22.5	73.96	24.02
6	16.9	28.7	27.0	24.5	2.9	28.02	24.30
7	0.4	2.7	4.7	27.3	64.9	94.78	7.56
8	19.3	33.1	35.0	6.8	5.8	62.50	27.72
9	4.8	26.3	16.5	40.2	12.2	44.58	30.34
10	18.0	40.0	8.6	24.2	9.2	39.57	30.28
11	33.5	50.4	2.1	9.5	4.5	87.12	18.90
12	0.6	6.4	9.7	54.5	28.8	86.23	15.95
13	17.9	47.6	21.2	12.2	1.1	11.51	13.66
14	0.8	2.7	4.1	37.7	54.7	94.58	8.70
15	2.3	14.2	30.6	36.8	16.1	17.22	18.41
16	6.6	32.8	22.9	31.5	6.2	38.33	26.43
17	3.5	19.0	13.6	43.9	20.0	68.99	21.72
18	9.1	16.7	4.8	54.3	15.1	73.99	20.96
19	34.2	50.3	8.7	6.2	0.6	83.97	21.06
20	12.4	29.3	28.7	25.4	4.2	28.19	20.58
21	57.1	33.7	3.9	3.4	1.9	93.39	9.80
22	6.9	16.6	33.7	33.9	8.9	43.06	28.49
23	1.5	7.1	15.9	60.8	14.7	74.53	23.00
24	15.7	30.3	9.9	33.8	10.3	56.72	31.49
25	5.6	19.9	11.8	49.9	12.8	70.55	25.38
26	1.9	8.3	9.9	59.4	20.5	77.66	25.62
27	2.3	9.8	49.1	35.1	3.7	43.89	26.47
28	0.8	18.2	6.8	45.9	28.3	78.98	20.62
29	2.3	14.9	23.0	54.5	5.3	62.84	23.48
30	1.3	2.1	5.9	59.4	31.3	89.49	17.37
31	36.6	43.8	5.3	9.9	4.4	82.39	25.65
32	4.5	24.5	11.9	39.3	19.8	33.69	23.75
33	1.2	7.7	14.9	66.7	9.5	77.44	19.16
34	6.2	26.2	44.0	22.3	1.3	25.62	25.41
35	0.0	7.3	5.4	44.0	43.3	91.22	11.60
36	2.7	14.5	14.9	52.8	15.1	72.94	20.80
37	12.3	32.9	20.5	30.4	3.9	33.83	22.10
38	4.5	11.2	5.3	46.5	32.5	87.80	19.04
39	25.1	46.6	7.5	13.8	7.0	74.90	24.28
40	2.7	18.3	9.6	52.8	16.6	68.88	24.35
41	6.8	21.0	36.7	31.8	3.7	34.50	23.68
42	13.0	40.8	10.9	32.8	2.5	55.96	25.39

[a]Underlined items are reverse scored.
[b]Statistics for department sensitivity analysis are calculated from the percentage of respondents in each department who responded Agree or Strongly Agree for positively-worded items or Strongly Disagree or Strongly Disagree for negatively worded items. Sample: 489 academic staff in 52 university departments.

BEST COPY AVAILABLE

However, these endorsement proportions do not preserve department membership. Accordingly, a second analysis investigating department sensitivity similar to that advocated by Pace (1969) was conducted in the following way. For each positively worded item and for each department, the percentage of respondents who responded Agree or Strongly Agree was determined. Next, the mean and standard deviation of this distribution were calculated. For negatively worded items, a similar calculation was performed using Disagree or Strongly Disagree responses. Table II shows these statistics. To ensure that an item is assessing a department characteristic that is neither too common nor too rare, the mean should be above 10 and below 90. To ensure a reasonable spread across the departments, a standard deviation of 10 or more is recommended by Pace. The data of Table II generally fit within these parameters.

Factor Analyses

To verify the seven-factor structure to this instrument, a principal components analysis (with varimax rotation) using the individual as the unit of analysis was performed. This analysis extracted seven factors that accounted for 52.2% of the variance. As shown in Table III, all items had loadings of at least 0.40 with their *a priori* scale and less than 0.40 with other scales. Twenty-eight items had loadings above 0.60 with their *a priori* scale. As the ratio of cases to items was 13:1, this seven-factor solution was considered a valid representation of the overall structure of the instrument. A similar analysis using the department mean as the unit of analysis revealed a similar factor structure and that these seven factors accounted for 68.5% of the variance.

Internal Consistency Reliability

Estimates of the internal consistency of the seven scales were calculated using Cronbach's coefficient alpha. As shown in Table IV, these coefficients ranged from 0.65 for the Concern for Research and Scholarship scale to 0.87 for the Affiliation scale with the individual as the unit of analysis. When the department mean was used as the unit of analysis, reliabilities ranged from 0.75 to 0.91 for these scales. Item-scale correlations confirmed that all items had been assigned to the appropriate scale and that each item made an appreciable contribution to that scale's internal consistency. Table IV also shows scale means and standard deviations using the individual and department mean as units of analysis.

Standard error data of Table IV ranged from 0.62 for Work Pressure with the department mean as the unit of analysis to 2.54 for the Concern for Research and Scholarship scale with the individual as the unit of analysis. Thus, it is unlikely that the 'true' means of any of the 52 departments vary much from their respective obtained means. Even with the Concern for Research and Scholarship scale, which had the lowest internal consistency reliability (0.75), the obtained department mean can be expected to fall within 2.60 of the 'true' department mean about 95% of the time, assuming a normal distribution of the mean scores.

TABLE III
FACTOR ANALYSIS RESULTS FOR SEVEN-FACTOR UNIVERSITY-LEVEL ENVIRONMENT QUESTIONNAIRE

Item number	Academic freedom	Concern for undergraduate learning	Concern for research & scholarship	Empowerment	Affiliation	Mission consensus	Work pressure
1	.64						
8	.67						
15	.40						
22	.62						
29	.52						
36	.63						
2		.63					
9		.66					
16		.76					
23		.69					
30		.46					
37		.41					
3			.66				
10			.42				
17			.40				
24			.57				
31			.65				
38			.61				
4				.67			
11				.50			
18				.69			
25				.71			
32				.59			
39				.58			
5					.71		
12					.70		
19					.67		
26					.70		
33					.66		
40					.60		
6						.65	
13						.67	
20						.68	
27						.50	
34						.64	
41						.66	
7							.66
14							.42
21							.41
28							.57
35							.65
42							.61

Factor loadings smaller that .40 have been omitted. Sample: 489 academic staff in 52 university departments.

BEST COPY AVAILABLE

TABLE IV
INTERNAL CONSISTENCY RELIABILITY (ALPHA COEFFICIENT), SCALE MEAN, STANDARD DEVIATION AND STANDARD ERROR FOR SEVEN UNIVERSITY ENVIRONMENT SCALES FOR TWO UNITS OF ANALYSIS

Scale	Alpha coefficient		Mean		Standard deviation		Standard error	
	Individual	Dept. mean	Individual	Dept. mean	Individual	Dept. mean	Individual	Dept. mean
Academic Freedom	.74	.81	20.43	21.02	3.86	1.77	1.98	.86
Concern for Undergraduate Learning	.72	.80	20.50	20.14	3.93	1.95	2.09	.87
Concern for Research & Scholarship	.65	.75	20.47	21.87	4.30	2.61	2.54	1.30
Empowerment	.82	.87	20.96	21.73	5.02	2.76	2.13	.99
Affiliation	.87	.91	23.21	23.16	4.32	2.11	1.56	.92
Mission Consensus	.78	.84	16.96	17.12	3.99	1.85	1.87	.74
Work Pressure	.78	.85	24.59	25.32	3.79	1.61	1.76	.62

Sample: 489 academic staff in 52 university departments.

BEST COPY AVAILABLE

Discriminant Validity

Table V reports discriminant validity data using the mean correlation of a scale with the remaining six scales as a convenient index. These data indicate that the scales do overlap but not to an extent that would violate the ULEQ's psychometric properties. Additionally, the conceptual distinctiveness of each of the scales warrants their retention in the ULEQ.

Ability to Discriminate Between Departments

One-way ANOVAs for department environment scales with the academic as the unit of analysis and department membership as the main effect showed that each scale differentiated between departments ($p < 0.05$). An estimate of the proportion of the variance in ULEQ scale scores attributable to department membership is provided by the eta^2 statistic, which is the ratio of 'between' to 'total' sums of squares (Cohen and Cohen, 1975). Table V shows that eta^2 values ranged from 15% for the Work Pressure scale to 48% for the Concern for Research and Scholarship scale.

TABLE V
MEAN CORRELATIONS AND ANOVA RESULTS FOR DEPARTMENT MEMBERSHIP DIFFERENCES IN PERCEPTIONS OF THE UNIVERSITY ENVIRONMENT

Scale	Mean Correlation		ANOVA Results	
	Individual	Dept. Mean	F(51, 435)	Eta^2
Academic Freedom	.33	.40	2.95**	.29
Concern for Undergraduate Learning	.23	.30	1.72*	.19
Concern for Research & Scholarship	.24	.40	6.80**	.48
Empowerment	.38	.46	2.31**	.24
Affiliation	.38	.51	1.50*	.17
Mission Consensus	.30	.41	1.75*	.18
Work Pressure	.05	.11	1.38*	.15

*$p < 0.05$
**$p < 0.001$
Sample: 489 academic staff in 52 university departments.

Conclusion

This article has reported the development of a new instrument to assess seven dimensions of the institutional environment of universities (Academic Freedom, Concern for Undergraduate Learning, Concern for Research and Scholarship, Empowerment, Affiliation, Mission Consensus, and Work Pressure). Comprehensive validation information for this instrument, the University-Level

Environment Questionnaire (ULEQ), attests to its sound psychometric characteristics (e.g. factorial validity and internal consistency reliability) for use with academics in Australian universities.

Three broad research directions involving the ULEQ are suggested. First, the ULEQ could be used by universities to monitor their institutional environment. Senior administrators should consider the usefulness of the ULEQ as one component in the evaluation of the overall quality of their universities. Second, individual university academics, departments or schools could use the ULEQ as a diagnostic tool. Such practical applications typically involve an initial administration of the questionnaire, formulation of intervention strategies based on questionnaire results, use of intervention strategies, and re-administration of the questionnaire to establish the effectiveness of the intervention (Yarrow et al., 1997). Third, the ULEQ could be employed in studies analogous to school environment research conducted in primary and secondary schools. These studies could focus on the effects of university-level environment on student outcomes and academics' teaching quality and research productivity, and possible determinants of institutional environment including the gender composition of academic staff, governance, and university and department characteristics (e.g. location, type, size).

Conceptually, the ULEQ was developed within the strong tradition of national and international learning environment research that has been firmly established over the past 30 years (Fraser, 1998a). Because its scales are relevant to any university, the ULEQ or context-specific derivatives of the ULEQ could be used in other countries with a high degree of confidence. Clearly, studies that provide cross-validation data from other countries are needed to verify its generalisability. As quality assurance in universities is a worldwide phenomenon, it is hoped that the ULEQ will provide the impetus for further studies on the institutional environment in colleges and universities.

References

Anderson, C.S. (1982). The search for school climate: A review of the research. *Review of Educational Research*, 52, 368–420.

Bailey, M. (1979). The art of positive principalship. *Momentum*, 10(2), 46–47.

Baldwin. P.J. (1991). *Higher education: Quality and diversity in the 1990*. Canberra, Australia: Australian Government Publishing Services.

Ball, J., Moselle, K. & Fraser, B.J. (1995, April). *A study of school climate and teacher burnout*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Barker, R.G. (1963). On the nature of the environment. *Journal of Social Issues*, 19(4), 17–38.

Bowden J.A. & Sachs, J. (1997). *Managing the quality of university learning and teaching: The Eltham symposium*. Canberra, Australia: Australian Government Publishing Services.

Brookover, W.B., Schweitzer, J.H., Schneider, J.M., Beady, C.H., Flood, P.K. & Wisenbaker, J.M. (1978). Elementary school social climate and school achievement. *American Educational Research Journal*, 15, 301–318.

Clarke, J.A. (1995). Tertiary students' perceptions of their learning environments: A new procedure and some outcomes. *Higher Education Research and Development*, 14, 1–12.

Cohen, J. & Cohen, P. (1975). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum.

Coyne, R. (1975). Environmental assessment: Mapping for counselor action. *Personnel and Guidance Journal*, 54, 150–155.

Cresswell, J.C. & Fisher, D.L. (1996, April). *Relationships between principal's leadership style and the school environment.* Paper presented at the annual meeting of the American Educational Research Association, New York.

Dawkins, J.S. (1988). *Higher education: A policy statement.* Canberra, Australia: Australian Government Publishing Services.

Dellar, G.B. (1997, March). *Assessing school climate and its relationship to school environment.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Department of Employment, Education, Training and Youth Affairs (DEETYA). (1997). *Characteristics and performance of higher education institutions (A preliminary investigation)* [On-line]. Available Internet: http:www.deetya.gov.au/ divisions/ hed/ highered/ otherpub/ heperf.pdf.

Dippelhofer-Stiem, B. (1986). How to measure university environment? Methodological implications and some empirical findings. *Higher Education*, 15, 475–495.

Duke, D.L. & Perry, C. (1978). Can alternative schools succeed where Benjamin Spock, Spiro Agnew & B.F. Skinner have failed? *Adolescence*, 13, 375–392.

Ellett, C.D. & Walberg, H.J. (1979). Principals' competency, environment, and outcomes. In H.J. Walberg (Ed.), *Educational environments and effects: Evaluation, policy and productivity* (pp. 140–164). Berkeley, CA: McCutchan.

Erickson, D.A. (1981). The superior social climate of private schools. *Momentum*, 12(3), 5–8.

Fisher, D.L. (1997, March). *Actual and preferred perceptions of a principal's interpersonal behaviour and school climate.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Fisher, D.L. & Fraser, D.L. (1991). School climate and teacher professional development. *South Pacific Journal of Teacher Education*, 19(1), 17–32.

Fisher, D.L., Fraser, B.J. & Wubbels, Th. (1993). Interpersonal teacher behavior and school environment. In Th. Wubbels & J. Levy (Eds.), *Do you know what you look like? Interpersonal relationships in education* (pp. 103–112). London: Falmer Press.

Fisher, D., Kent. H. & Fraser, B. (1998). Relationships between teacher-student interpersonal behaviour and teacher personality. *School Psychology International*, 19(2), 343–363.

Flagg, J.T., Jr. (1965). The organizational climate of schools: Its relationship to pupil achievement, size of school, and teacher turnover. *Dissertation Abstracts*, 26, 818–819.

Fraser, B.J. (1994). Research on classroom and school climate. In D. Gabel (Ed.), *Handbook of research on science teaching and learning* (pp. 493–541). New York: Macmillan.

Fraser, B.J. (1998a). Science learning environments: Assessments, effects and determinants. In B.J. Fraser & K.G. Tobin (Eds.), *International handbook of science education* (pp. 527–564). Dordrecht, The Netherlands: Kluwer.

Fraser, B.J. (1998b). Classroom environment instruments: Development, validity, and applications. *Learning Environments Research*, 1, 7–33.

Fraser, B.J., Docker, J.C. & Fisher, D.L. (1988). Assessing and improving school climate. *Evaluation and Research in Education*, 2(3), 109–122.

Fraser, B.J., Giddings, G.J. & McRobbie, C.J. (1992). Assessment of the psychosocial environment of university science laboratory classrooms: A cross-national study. *Higher Education*, 24, 431–451.

Fraser, B.J. & Rentoul, A.J. (1982). Relationships between school-level and classroom-level environment. *Alberta Journal of Educational Research*, 28, 212–225.

Fraser, B.J. & Treagust, D.F. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. *Higher Education*, 15, 37–57.

Gaff, J.G., Crombag, H.F.M. & Chang, T.M. (1976). Environments for learning in a Dutch university. *Higher Education*, 5, 285–299.

Glatthorn, A.A. (1984). Goodlad study raises vital issues. *Momentum*, 15(3), 59–61.

Goodlad J.I. (1984). *A place called school.* New York: McGraw-Hill.

Halpin, A.W. & Croft, D.B. (1963). *Organizational climate of schools.* Chicago, IL: Midwest Administration Center, University of Chicago.

Heroman, D.S., Pol, S. & Daniel, C. (1997, March). *Beginning teachers' perceptions of their school environment: Before and after Goals 2000.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Higher Education Council. (1992). *Higher education: Achieving quality.* Canberra, Australia: Australian Government Publishing Services.

Higher Education Council. (1997). *Achieving quality outcomes in higher education.* Canberra, Australia: Author.

Kottkamp, R.B., Mulhern, J.A. & Hoy, W.K. (1987). Secondary school climate: A revision of the OCDQ. *Educational Administration Quarterly*, 23(3), 31–48.

Moos, R.H. (1974). Systems for the assessment and classification of human environments: An overview. In R.H. Moos & P.M. Insel (Eds.), *Issues in social ecology: Human milieus* (pp. 5–28). Palo Alto, CA: National Press Books.

Moos, R.H. (1986). *Work Environment Scale manual* (2nd ed.). Palo Alto, CA: Consulting Psychologists Press.

New York State Department. (1976). *Which school factors relate to learning? Summary of findings of three sets of studies.* Albany, NY: Bureau of School Programs Evaluation, New York State Department.

Pace, C.R. (1963). Differences in campus atmosphere. In W.W. Charters & N. Gage (Eds.), *Readings in the social psychology of education* (pp. 73–79). Boston, MA: Allyn & Bacon.

Pace, C.R. (1969). *College and university environment scales* (2nd ed.). Princeton, NJ: Educational Testing Service.

Pace, C.R. & Stern, G.G. (1958). An approach to the measurement of the psychological characteristics of college environments. *Journal of Educational Psychology*, 49, 269–277.

Peterson, R.E., Centra, J.A. Hartnett, R.T. & Linn, R.L. (1983). *Institutional Functioning Inventory: Preliminary technical manual.* Princeton, NJ: Educational Testing Service.

Polytechnics and Colleges Funding Council. (1990). *Teaching quality: Report of the Committee of Inquiry appointed by the Council.* London: Her Majesty's Stationery Office.

Ramsden, P. (1979). Student learning and perceptions of the academic environment. *Higher Education*, 8, 411–427.

Rutter, M., Maughan, B., Mortimore, P., Ouston, J. & Smith, A. (1979). *Fifteen thousand hours: Secondary schools and their effects on children.* Somerset, UK: Open Books.

Stern, G.G. (1970). *People in context: Measuring person-environment congruence in education and industry.* New York: Wiley.

Templeton, R.A. & Johnson, C.E. (1998). Making the school environment safe: Red Rose's formula. *Learning Environments Research*, 1, 35–57.

Thomas, A.R. (1976). The organisational climate of schools. *International Review of Education*, 22, 441–463.

van Rooijen, L. (1986). Advanced students' adaptation to college. *Higher Education*, 15, 197–209.

Vyskocil, J.R. & Goens, G.A. (1979). Collective bargaining and supervision: A matter of climate. *Educational Leadership*, 37, 175–177.

Wilson, B. (1996). Quality in universities: Sir Robert Menzies Oration, 4 October 1995. *Journal of Higher Education*, 18, 149–158.

Yarrow, A., Millwater, J. & Fraser, B. (1997). Improving university and primary school classroom environments through preservice teachers' action research. *Practical Experiences in Professional Education*, 1(1), 68–93.

Appendix

University-Level Environment Questionnaire (ULEQ)

Instructions

This questionnaire is about the quality of your university learning environment. Your opinion about each question is sought. You are asked to give your opinion on statements about your university. Please answer by circling the number under Strongly Agree, Agree, Not sure, Disagree or Strongly Disagree.

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	Students are free to express their beliefs about academic work.	1	2	3	4	5
2.	There is not much contact between lecturers and students outside the classroom.	1	2	3	4	5
3.	Most staff members have had papers or books published in the past two or three years.	1	2	3	4	5
4.	I am authorised to make decisions.	1	2	3	4	5
5.	I receive encouragement from colleagues.	1	2	3	4	5
6.	The organisation of this university reflects its goals.	1	2	3	4	5
7.	There is a constant pressure on academics to keep working.	1	2	3	4	5
8.	Controversial figures in public life are not allowed to address students.	1	2	3	4	5
9.	Lecturers get to know most students in their undergraduate classes quite well.	1	2	3	4	5
10.	In my faculty, there are a number of academic staff whose appointments primarily entail research rather than teaching.	1	2	3	4	5
11.	I have to refer even the smallest matters to a senior member of staff.	1	2	3	4	5
12.	I feel accepted by other academics.	1	2	3	4	5
13.	Lecturers regularly refer to the mission of the university when addressing university issues.	1	2	3	4	5
14.	Lecturers have to work long hours to complete their work.	1	2	3	4	5
15.	Eccentric convictions and unpopular beliefs among staff members and students are not liked by senior administrators.	1	2	3	4	5
16.	Most staff members do not spend much time talking with students about students' personal interests and concerns.	1	2	3	4	5
17.	Staff promotions are based on scholarly publications.	1	2	3	4	5
18.	I am asked to participate in decisions concerning administrative policies and procedures.	1	2	3	4	5
19.	I am ignored by other academics.	1	2	3	4	5
20	The operation of this university is consistent with its goals.	1	2	3	4	5

BEST COPY AVAILABLE

Appendix

Continued

		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
21.	Academics don't have to work hard in this university.	1	2	3	4	5
22.	Staff members are free to express radical political beliefs in their classrooms.	1	2	3	4	5
23.	Staff members are sensitive to the interests, needs and aspirations of undergraduates.	1	2	3	4	5
24.	Few staff members have national or international reputations for their scholarly contributions.	1	2	3	4	5
25.	I am encouraged to make decisions without reference to a senior members of staff.	1	2	3	4	5
26.	I can rely on my colleagues for assistance if I need it.	1	2	3	4	5
27.	My views of the overall mission of this university are very similar to other staff members.	1	2	3	4	5
28.	There is no time for academics to relax.	1	2	3	4	5
29.	Students are encouraged to criticise academic work.	1	2	3	4	5
30.	Lecturers are interested in helping students learn.	1	2	3	4	5
31.	Senior academics do not emphasise research as an important institutional purpose.	1	2	3	4	5
32.	I have little say in the running of the university.	1	2	3	4	5
33.	My colleagues take notice of my professional views and opinions.	1	2	3	4	5
34.	Lecturers agree on the university's overall goals.	1	2	3	4	5
35.	It is hard for academics to keep up with their work load.	1	2	3	4	5
36.	Staff and students may discuss any topic.	1	2	3	4	5
37.	In recruiting new staff members, as much importance is given to teaching ability as to scholarly contribution.	1	2	3	4	5
38.	Departments hold seminars in which staff or visiting scholars discuss research.	1	2	3	4	5
39.	My superiors deal with me in an authoritarian manner.	1	2	3	4	5
40.	I have many friends among my colleagues at this university.	1	2	3	4	5
41.	The university mission statement and its associated goals are understood by academics.	1	2	3	4	5
42.	Lecturers have sufficient time to discuss academic issues informally with their colleagues.	1	2	3	4	5

[a] Underlined items are reverse scored

BEST COPY AVAILABLE